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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,494	10/27/2003	Masaru Ishikawa	US01-03014	3140

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EXAMINER

DINH, JACK

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/693,494	Applicant(s) ISHIKAWA ET AL.	
	Examiner Jack Dinh	Art Unit 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>DETAILED ACTION</u> . |

DETAILED ACTION

Claim Objections

1. Claims 18, 24 and 25 are objected to because of the following informalities. Regarding claim 18 lines 7-8, claim 24 lines 12-13, and claim 25 lines 3, the phrase “create an imaging plane” is considered technically incorrect. The micro lens array assembly cannot physically create an imaging plane. The micro lens array assembly can only create an image, which is then projected onto an existing imaging plane. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18-23, 33 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 18, the phrase “by providing an illusion of depth in the displayed real image that is consistent with a three-dimensional object” renders the claim indefinite. There are numerous ways a display image can be considered or interpreted as “consistent with a three dimensional object”. The claimed limitation is unclear because the claimed language does not provide definite conditions or requirements of the components or the entire apparatus for what it meant to be “consistent with a three-dimensional object”. The claim is also indefinite in that it

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fails to point out what is included or excluded by the claim language. Claims 19-23 are rejected based upon the rejected base claim. The rejections below are based on the broadest possible interpretation.

Regarding claims 33 and 34, the phrase “an imaging plane resulting from said plurality of micro lens arrays” renders the claim indefinite. It is unclear how an imaging plane can be resulted from a plurality of micro lens arrays.

Claims 30-35 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01.

Regarding claim 30, the omitted element is the imaging plane. An imaging plane is an essential feature for displaying a real image. Claims 31-35 are rejected upon the rejected base claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 25, 26 and 29 are rejected under 35 U.S.C. 102(a) as being unpatentable by Clarke (US Patent 6,462,795).

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Regarding claim 25, Clarke (figure 2) is interpreted as disclosing an image display apparatus comprising a display 10 for displaying a two-dimensional image, and a microlens array 22 spaced apart from the display for creating an image on an imaging plane 12 in a space opposite the display, the micro lens array being an upright image optical system having a same magnification (see diamond-shape rays in the figure), the microlens array being not parallel to the display (see figure).

Regarding claim 26, Clarke (figure 2) is interpreted as further disclosing that the microlens 22 array includes a plurality of identical microlenses.

Regarding claim 29, Clarke (figure 2) is interpreted as further disclosing that the display is positioned within a focal depth of the microlens array (see figure).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke (US Patent 6,462,795) in view of Shanks (US Patent 4,414,565).

Regarding claim 18, Clarke (figure 2) is interpreted as disclosing an image display apparatus providing an enhanced impression of an optical perspective, the apparatus comprising a micro lens array assembly comprising a plurality of convex micro lenses **20** and **21** arranged in a convex micro lenses matrix **20-30-21** to thereby form a lens system, and a display **10** located relative to the micro lens array assembly to project a two-dimensional image through the micro lens array assembly to be focused on an opposite side thereof as an imaging plane **12** (col. 4, lines 44-61), the micro lens array assembly configured to create an erect real image of the two dimensional image displayed on the imaging plane. Clarke further discloses that the image transmitting panel being non-parallel to the imaging plane (see dotted line 16). Clarke is interpreted as disclosing all the claim limitations except that the image displayed is at the same magnification, and for explicitly stating that the purpose of the image transmitting panel being non-parallel to the imaging plane so that the real image displayed opposite the display has an enhanced three-dimensional impression of the two-dimensional image by providing an illusion of depth in the displayed real image that is consistent with a three-dimensional object. However, when the image is displayed by the imaging plane, magnification can be varied depending on the distance from the imaging plane to the display. Having the same magnification would have been well within the knowledge of one skilled in the art. Within the same field of endeavor, Shanks (figures 1 and 2c) is interpreted as disclosing the teaching that a curved or unparallel imaging plane **3** can create a three dimensional characteristics as shown in figure 2c (col. 3, lines 3-7). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a curved or non-parallel imaging plane, for the purpose of creating a three-dimensional impression to the image.

Regarding claim 19, Clarke (figure 2, not drawn to scale) is interpreted as further disclosing that the micro lens array assembly **20-30-21** comprises a micro convex lens board having two lens array halves (tiny microlenses on plate 20 and 21), each lens array half comprising a transparent flat plate **20** and **21** with a plurality of convex lenses arranged in a matrix on each flat surface thereof.

Regarding claim 20, Shanks (figure 5) is interpreted as further disclosing that the enhanced three-dimensional impression is caused by locating the micro lens array assembly **7** relative to the display **6** in an inclined orientation (col. 4, lines 20-28).

Regarding claim 21, Shanks (figure 5) is interpreted as further disclosing that the enhanced three-dimensional impression is caused by locating the micro lens array assembly **7** relative to the display **6** in an inclined orientation (col. 4, lines 20-28). Clarke in view of Shanks is interpreted as disclosing all the claimed limitations except for providing a plurality of the microlens array assemblies with corresponding displays. However, providing a plurality of sub-displays to form a large composite image would have been an obvious modification to one of ordinary skill in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to a plurality of the microlens array assemblies with corresponding displays, for the purpose of creating a large composite image comprising a plurality of individual sub-displays.

Regarding claim 22, Shanks (figure 2b) is interpreted as further disclosing that the imaging plane has an inclined flat shape (col. 3, lines 3-17).

Regarding claim 23, Shanks (figures 1 and 2c) is interpreted as further disclosing that the imaging plane has an inclined curved shape (col. 3, lines 3-17).

Regarding claim 24, Clarke (figure 1, col. 3, line 43 – col. 4, line 31) is interpreted as disclosing a method comprising providing a micro lens array assembly comprising a plurality of convex micro lenses arranged in a matrix **20, 21, 22** to thereby form a lens system, and projecting a two-dimensional image through the micro lens array assembly to be focused on an opposite side as an imaging plane **12** (col. 4, lines 44-61). Clarke is interpreted as disclosing all the claim limitations except that the image is enhanced with a three-dimensional impression is caused by locating the micro lens array assembly relative to the display in an inclined orientation. Within the same field of endeavor, Shanks (figure 5) is interpreted as further disclosing the teaching that an enhanced three-dimensional impression is caused by locating the micro lens array assembly **7** relative to the display **6** in an inclined orientation (col. 4, lines 1-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to position the micro lens array assembly relative to the display in an inclined orientation, for the purpose of creating a three-dimensional impression to the image.

5. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke (US Patent 6,462,795), as applied to claim 25, in view of Yoshikawa et al (US Patent 6,462,794).

Regarding claim 27, Clarke is interpreted as disclosing all the claimed limitations as describe above except that the microlens array includes a plurality of paired convex lens halves arranged two-dimensionally, and each paired convex lens halves are coaxial with each other so that a single optical axis is defined by each paired convex lens halves. Within the same field of endeavor, Yoshikawa (figure 3) is interpreted as disclosing a microlens array 5 includes a plurality of paired convex lens halves arranged two-dimensionally, and each paired convex lens halves are coaxial with each other so that a single optical axis is defined by each paired convex lens halves. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a plurality of paired convex lens halves arranged two-dimensionally, and each paired convex lens halves are coaxial with each other so that a single optical axis is defined by each paired convex lens halves, as taught by Yoshikawa, for the purpose of creating a microlens array.

6. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke (US Patent 6,462,795), as applied to claim 25, in view of Shinoura (US Patent 6,714,173).

Regarding claim 28, Clarke is interpreted as disclosing all the claimed limitations as describe above except that the microlens array is flat and the display partly bends relative to the microlens array. Within the same field of endeavor, Shinoura (figures 8 and 9) is interpreted as disclosing that a three-dimensional image can be created by either bending the display 10 relative to the lens 20 as shown in figure 8, or bending the lens 20 in relative to the display 10 as shown in figure 9. Therefore, it would have been obvious to one of ordinary skill in the art at the time

the invention was made to have the display bends relative to the lens array, as taught by Shinoura, for the purpose of creating a three-dimensional impression to the image.

Response to Arguments

7. Applicant's arguments have been fully considered but they are not persuasive.

I. THE CLAIMED INVENTION

No argument was provided.

II. THE CLAIM OBJECTION

Applicant's arguments have been fully considered but they are not persuasive.

Technically speaking, the micro lens array assembly cannot physically create an imaging plane.

The micro lens array assembly can only create an image, which is then projected onto an existing imaging plane.

III. THE REJECTION UNDER 35 USC 112, FIRST PARAGRAPH

Applicant's arguments have been fully considered but they are not persuasive. The Applicant argues that even the Examiner concedes: "... an imaging plane is an essential feature for displaying a real image." Moreover, dependent claims 33 and 34 expressly describe the imaging plane. The Examiner disagrees. Although the concept is known, an imaging plane is a required component in order to display an image. Although claim 33 and 34 expressly describe this feature, any claim must be in complete form whether independent or dependent.

IV. THE REJECTION UNDER 35 USC 112, SECOND PARAGRAPH

Applicant's arguments have been fully considered but they are not persuasive. There are numerous ways a display image can be considered or interpreted as "consistent with a three

dimensional object”. The claimed limitation is unclear because the claimed language does not provide definite conditions or requirements of the components or the entire apparatus for what it meant to be “consistent with a three-dimensional object”. The claim is also indefinite in that it fails to point out what other ways are included or excluded by the claim language. Claims 19-23 are rejected based upon the rejected base claim. The rejections below are based on the broadest possible interpretation.

V. PRIOR ART REJECTIONS

The Anticipation Rejection

Applicant's arguments have been fully considered but they are not persuasive.

Regarding claim 25, the Applicant argues that in Clarke there is no teaching or suggestion of : “...a micro lens array spaced apart from the display for creating an imaging plane in a space opposite the display, the micro lens array being an upright image optical system having a same magnification, the micro lens array being not parallel to the display.” The Applicant argues that Clarke teaches having the display 10 parallel to the micro lens array 30. The Examiner disagrees since Clarke also teaches a micro lens array 22, which is not parallel to the display 10. The Applicant argues that Clarke does not tilt the display relative to the screen while maintaining same magnification of the micro lenses. The Examiner found the argument not persuasive since the language used in the argument is not part of the claim. Furthermore, Clarke discloses the micro lens array being an upright image optical system having a same magnification, indicated by the equidistant spacings between the diamond-shaped rays on the display 10 and those on the imaging plane 12 (col. 5, line 1).

Regarding claim 26, the Applicant argues that Clarke, at lines 32-36 of column 5 explicitly mentions that the micro lenses in the array 22 have different radius of curvature. The Examiner disagrees. Column 5, line 1, Clarke also discloses that the microlenses in the array 20 may be substantially identical.

The Obviousness Rejection Based on Shanks

Regarding claim 18, the Applicant states that the Examiner considers that Clarke teaches all limitations of claim 18 except that the image is displayed at the same magnification; to overcome this deficiency, the Examiner invokes Shanks. The Examiner disagrees. The claim rejection relies on Shanks only to show the “three-dimensional characteristics”. The Applicant further argues that Clarke and Shanks are non-analogous art. The Examiner disagrees since Clarke and Shanks both disclose a curved or unparallel imaging plane which creates a three dimension characteristic. Therefore, Clarke and Shanks are art analogous. The Applicant further argues that Clarke does not describe therein as attempting to enhance the three-dimensional quality of the image. The Examiner disagrees. There are numerous ways a display image can be considered or interpreted as “enhancing a three dimensional object”. The Applicant fails to provide definite conditions or requirements of the components or the configuration of the entire apparatus for what it meant to be “enhanced three-dimensional impression”, as noted in the 35 USC 112 2nd paragraph above. Therefore, the rejection can be interpreted with the broadest interpretations.

The Obviousness Rejection Based on Shinoura

Regarding the recently added claim 28, the Applicant argues that this claim reflects the embodiment shown in figure 11, wherein the micro lens array is flat (or does not bend), and the

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micro lens array 22 of Clarke bends. The Applicant further argues that the saddle-shaped surface 3 of Shanks is not needed in the present invention, since it displays an image in space. The Applicant presents arguments using the language not presented in the claim. Therefore, the argument is moot.

Other Information/Remarks

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Dinh whose telephone number is 571-272-2327. The examiner can normally be reached on M-F (9:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky L. Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jack Dinh
04/19/06



Loha Ben
Primary Examiner